STATE OF CALIFORNIA
DEPARTMENT OF FISH AND GAME

PESTICIDE LABORATORY REPORT

1701 Nimbus Road, Suite F
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Lab No: **P-2521** **Date Received: November 10, 2007**

E.P. No. L-678, -683, -688-07 **Sample: birds, water**

Index: 6600 PCA: 56623

To: Robert Leavitt **Report Date: March 7, 2008**
Department of Food and Agriculture

Remarks

Background

From 11/7/07 to 12/2/07, approximately 650 birds were found dead or in a distressed condition in various locations around Monterey Bay, California (Table 1). Birds were covered with a yellow viscous material. Observations from the Marine Wildlife Veterinary Care and Research Center indicated that the die-offs may be associated with an algal bloom. Water samples were also collected from the vicinity of the loss. Samples of the feathers from dead birds were collected and sent to the CDFG Water Pollution Control Laboratory (WPCL) and Petroleum Chemistry Laboratory (PCL) to determine the cause of the loss.

RESULTS OF EXAMINATION

Using GC/MS, PCL compared feather extracts to samples of Checkmate-F. No constituents of Checkmate-F were found on the feathers. Nor was the presence of petroleum hydrocarbons or surfactants indicated.

The samples were sent to WPCL for confirmation. At WPCL, extracts from the feathers were analyzed using LC/MS/MS. Results indicated that the responsible agent was not a hydrocarbon nor cyanobacteria. WPCL also analyzed samples for constituents of Checkmate-F and found none of the active ingredients. LC/MS analysis revealed peptide chains that were consistent with peptides found in algal proteins.

Table 1. Moss Landing Mystery Spill Birds Collected

Location	Species (number)
Marina Street Beach	Sooty shearwater (1), Northern fulmar (127), Surf scoter (3), Clark's grebe (1)
Capitola	Surf scoter (9), Clark's grebe (27), Western grebe (38), California gull (1), Pacific loon (7), Rednecked grebe (1), Horned grebe (2), Western gull (1), Red-throated loon (2), Eared grebe (2), White-winged scoter (1)
Moss Landing	Western grebe (24), Northern fulmar (3), Clark's grebe (19), Common murre (1), Horned grebe (1), Brown pelican (8), Western gull (2)
Cowell's Beach	Surf scoter (3), Western grebe (3)
Main Beach	Western grebe (18), Surf scoter (7), Clark's grebe (7), Common murre (2), Pacific loon (1), Red-throated loon (1)
Rio Del Mar	Surf scoter (13), White-winged scoter (1), Horned grebe (2), Common loon (3), Western Grebe (4), Red-throated loon (1)
26th Street Beach	Surf scoter (1)
San Lorenzo	Western grebe (2)
Natural Bridges	Common murre (1), Brandt's cormorant (1)
Santa Cruz Boardwalk	Western grebe (9), Clark's grebe (1)
Santa Cruz Wharf	Surf scoter (1), Brown pelican (1)
Yacht Harbor	Clark's grebe (9), Western grebe (28), Common loon (1), Red-throated loon (2), Northern fulmar (1), Eared grebe (1), Horned grebe (1), Brown pelican (1)
New Brighton Beach	Brandt's Cormorant (1), Surf scoter (3), Common loon (1), Western grebe (13), Western gull (1), Horned grebe (3), Red-throated loon (1), Clark's grebe (15), Eared grebe (1)
Seascape	Surf scoter (2), California gull (1), Western grebe (1)
HS Beach	Western grebe (1)
Waddell	Rhinoceros auklet (1), Western grebe (1)
Salinas River Refuge	Northern fulmar (5), Common murre (1)
Seabright	Western grebe (5), Brandt's cormorant (2), Surf scoter (2), Common murre (2), Red-throated loon (1), Pacific loon (1)
Seacliff	White-winged scoter (3), Surf scoter (14), Western grebe (4), California gull (1), Common murre (1), Common loon (1), Horned grebe (2), Red-throated loon (2), Western gull (2), Clark's grebe (1)

Conclusion

It was not possible to determine with certainty the cause of the bird strandings in the Monterey Bay area in November 2007. However, analytical results indicate that the cause was not the application of Checkmate-F for Light Brown Apple Moth control, nor hydrocarbons, nor a cyanobacteria. Analytical results are consistent with an algal bloom as being a potential cause of the incidents.

Chemical analyses were performed by Ms. Marida Martin at the PCL and Mr. Abdou Mekebri at WPCL.

PESTICIDE INVESTIGATIONS UNIT
OFFICE OF SPILL PREVENTION AND RESPONSE

By Stella Borucki
Stella Borucki
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Approved _____
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Cc: Dave Jessup
California Department of Fish and Game
Office of Spill Prevention and Response

Chemical analysis (DFG):	**$16,544**
Assessment and report:	**350**
Total Cost of investigation:	**$16,894**